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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,621	03/29/2001	Kenji Todori	P 280037 T7K0-00S105-1	4396
909	7590	10/01/2003	EXAMINER	
PILLSBURY WINTHROP, LLP			ANGEBRANDT, MARTIN J	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			1756	

DATE MAILED: 10/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/819,621

Applicant(s)

TODORI ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. The response provided by the applicant has been read and given careful consideration.

Responses to the arguments are presented after the first rejection to which the argument is directed. Rejection of the previous office action not repeated below are withdrawn based upon the arguments and amendments of the applicant.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5,7-14,16-19 and 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida et al. EP 0580346, in view of Murray et al., "synthesis and Characterization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993), Spanel et al. '910 or Liz-Marzan, et al. WO 99/291934.

Iida et al. EP 0580346 teaches a high density optical disk with a shutter layer of semiconductor particles dispersed in a glass or polymeric matrix over coated with a reflective layer as shown in figure 2. Useful semiconductor materials in amounts of 1-80 mol % and having sizes of 0.1 to 50 nm are disclosed. (3/11-33) The use of polymers as the matrix materials, including PMMA, polycarbonate, polystyrenes, polyolefins, and epoxies is disclosed as its the formation of the layer from a solvent based solution. (3/34-41 and 4/3-13). The reflective layer may be various metals including Ag, Au, Al and Cu. (4/44-51). The use of protective layer is also disclosed. (4/52-57). Another embodiment is shown in figure 3.

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Spanel et al. '910 teaches semiconductor particles in a polymeric matrix, where ligands are used to bond to the surface of the particles to stabilize the particles and then polymerized to form a matrix. useful particles are disclosed. 2/22-29). The ligands bonding to the surface of the particles and them undergoing polymerization , including silanes and the like are disclosed. (2/66-3/45).

It would have been obvious to one skilled in the art to modify the article of Iida et al. EP 0580346 by using the processes of Spanel et al. '910 to form the particles alone or in their matrix with the benefit of increasing the stability of the dispersion and uniformity of the particles.

The examiner notes that claims 6, 15 and 20 specifically include the instance where the organic group is part of the polymer. The specification indicates that the organic group may be part of a larger molecule (page 22/lines 17-19) and the polymer may be formed by reaction of organic compounds (22/26-23/3), but discloses that it is preferred that the polymer is not covalently bound to the semiconductor particles due to the possibility of impurities (23/11-16). Based upon the disclosure, the examiner interprets the broad claims embrace the organic group being part of the polymer until the claims particularly specify otherwise. Please note that claims 6,15 and 20 are not rejected under this heading. The examiner notes that the claims do not exclude coated semiconductor particles as comprising language is used in the claims and therefore the semiconductor particles can be coated or not. To exclude this embodiment, the applicant likely would have to limit the composition of the semiconductor particle using "consisting of" language.

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4. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida et al. EP 0580346, in view of Murray et al., "synthesis and Characterization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993) and Liz-Marzan, et al. WO 99/291934.

Murray et al., "synthesis and Characterization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993), teaches the synthesis of nanocrystalline semiconductor particles to reduce polydispersity and improve the uniformity of surface derivitization (capping). (page 8706, right column) The ease of dispersal in various solvents (alkanes, aromatics, long chain alcohols, etc) is disclosed. (page 8707, left column). The use of these in optical is disclosed. (page 8706, left column)

Liz-Marzan, et al. WO 99/291934 teaches methods for stabilizing particles to prevent agglomeration/coalescence without affecting their properties.(2/16-22). The ligands which bond to the surface of the particles may be thiols, amines, phosphines, phosphates, borates, carboxylates, silicates, siloxy, ... (3/10-28). The stabilization of CdS and other semiconductor materials, having sizes of less than 100 nm, preferably less than 40 nm is disclosed. (7/24-8/17 and examples) The use of this technique for stabilizing the particles for optical uses in a variety of matrices, including polymers, is disclosed. (13/18-23).

It would have been obvious to one skilled in the art to modify the article of Iida et al. EP 0580346 by using the processes of either Murray et al., "synthesis and Characterization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993) with a reasonable expectation of gaining in monodispersity and stability in both solvents and the polymeric matrix based upon the teachings of Murray et al., "synthesis and

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Characterization of nearly monodisperse CdE (E=s,se,te) semiconductor nanocrystallites", JACS, Vol. 115(19) pp. 8706-8715 (1993) and Liz-Marzan, et al. WO 99/291934 of the desirability of stabilizing the particles in either solvents or polymeric matrices.

The rejection is based upon the combination of references, not any one of the references alone, therefore piecemeal analysis cannot hope to obviate the rejection.

5 Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the


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organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-808-0661.



Martin J Angebranndt
Primary Examiner
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September 29, 2003